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As one of its major activities in carrying out its purpose, the Society publishes a monthly magazine, the Canadian Geographical Journal, which is devoted to every phase of geography—historical, physical and economic—of Canada, of the British Commonwealth and of the other parts of the world in which Canada has special interest. It is the intention to publish articles in this magazine that

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Dorothy Wilding photograph

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Elizabeth
Other R

The Queen's Realms

by JAMES A. GIBSON

"Thou that of Thy free grace didst build up this Britannie Empire to a glorious and enviable height, with all her daughter islands about her, stay us in this felicity."

— John Milton: *Areopagitica*

THE CORONATION YEAR of Her Majesty Elizabeth II awakens echoes of the historic present as well as of the historic past, and it is opportune to look at the present nature and organization of the Queen's Realms and Territories. For within the lifetime of the present Sovereign new advances have been made in self-government, new dominions added, the stature of the self-governing realms enhanced, and new vistas marked out for the future development of peaceable co-operation and the welfare of mankind as a whole.

In the very year of Her Majesty's birth a majestic piece of definition launched the modern Commonwealth upon its impressive course. What we know as the Balfour Declaration described the "autonomous communities within the British Empire, equal in status, in no way subordinate one to another in any aspect of their domestic or external affairs, but united by a common allegiance to the Crown and freely associated as members of the British Commonwealth of Nations". Though these words accurately represented the conventions then governing the relationship between members of the Commonwealth, they were inconsistent with the position in strict law. The United Kingdom still possessed the formal right to pass laws applying to the other Commonwealth countries (even where the right had long fallen into disuse), and there were certain legal restrictions upon the powers of the parliaments of the dominions.

The Statute of Westminster, 1931, was enacted by the Parliament of the United Kingdom to make the legal facts square with

the actual political situation. After 1931, with a very few exceptions, it was competent for any member of the Commonwealth to repeal or amend legislation passed originally in the United Kingdom. These provisions did not apply to Australia, New Zealand or Newfoundland unless specifically enacted by their respective parliaments; and the power of the United Kingdom Parliament to legislate did not extend to the amending of the constitutions of Canada, Australia, and New Zealand.

Over the years, as might be expected, clarification was provided, generally by statute. In the case of Australia, the *Statute of Westminster Adoption Act, 1942* (effective retrospectively from 3 September, 1939) defined the position constitutionally within Australia. Comparable legislation in New Zealand was passed into law in the *Statute of Westminster Adoption Act, 1947*. Newfoundland is now (since March, 1949) covered as a province of Canada.

The powers of constitutional amendment now applying specifically to Australia and to New Zealand are an interesting commentary on the motif of political decentralization which is one of the arresting features of the modern Commonwealth. From their inception as "Dominions", Australia and the Union of South Africa have had substantive powers of amendment vested in their respective parliaments. In the Union of South Africa, the *Status of the Union Act, 1934*, provided that the Union legislature should be "the sovereign legislative power in and over the Union". The written constitutions of both Canada and New Zealand are embodied in Acts of the Parliament of the United Kingdom. In the case of Canada, the *British North America Act, 1867* (with subsequent amendments) gave the several provinces substantial powers to amend their own constitutions by provincial legislation. No comparable power was conferred upon the federal

authority; the original Act makes no provision for amendment of the Act itself; and the effect of successive judicial decisions over many years was that the federal authority possessed no such plenitude of powers extending to amendment as the provincial administrations have possessed from the beginning.

The way to amendment was, of course, not closed: the Parliament of the United Kingdom, on at least twelve occasions since 1867, acting most often on "appropriate request" conveyed by addresses from both houses of the Parliament of Canada, has amended *The British North America Act*. In 1949, *The British North America (No. 2) Act* added to the legislative authority of the Canadian Parliament the right to amend the constitution except in matters assigned by the Act exclusively to the provincial legislatures, rights and privileges already secured to provincial governments and legislatures, existing rights and privileges in the field of education, and the use of the English and French languages. The requirements that the Parliament of Canada should meet at least once in each year, and that no House of Commons should normally continue for more than five years, were expressly recited. Final revision of *The British North America Act* awaits the report of a committee of attorneys-general of the provinces on the avoidance of overlapping jurisdiction.

In the case of New Zealand, the *New Zealand Constitution (Amendment) Act, 1947* removed all remaining restrictions upon the legislative competence of the Parliament of New Zealand to alter, suspend or repeal any of the provisions of the original Constitution Act of 1852.

The amending of constitutions is, of course, only incidental to the larger outreach of the Commonwealth. Her Majesty Elizabeth II is sovereign over a larger aggregation of self-governing peoples than any of her royal predecessors, including three Asian "Dominions", India, Pakistan and Ceylon.

The constitutional position of India within the British Commonwealth is of unusual interest. As it is declared to be a sovereign

republic, the law no longer runs in the Queen's name, though India remains within the Commonwealth (on terms agreed to by the Commonwealth Prime Ministers in 1949) by acknowledging the Crown to be the symbol of the free association of the independent member nations, and the Sovereign to be the Head of the Commonwealth.

The basis of the *Government of India Act, 1935*, was that certain provisions of this Act originally incompatible with full self-government should, in course of time, be so modified or so fall into disuse that India, without major constitutional changes, might become an independent member of the Commonwealth. The provisions relating to a federation of all India, however, being unacceptable alike to the Congress Party and the Muslim League, never came into effect.

During 1947, under Lord Mountbatten's initiative, agreement was reached for a transfer of power to Indian hands and, following Mr. Attlee's announcement of June 3, 1947 that power would probably be transferred that year, the *Indian Independence Act, 1947*, was passed, and came into effect on 15 August. Mr. Attlee, earlier, had made it clear that it would be for India to say, without pressure of any kind, whether she wished to remain within the Commonwealth or not.

Under this Act provision was made for the creation of two independent states, India and Pakistan. In each state a Constituent Assembly was invested with sovereign and plenary powers. Until separate new constitutions should be drafted, the *Government of India Act, 1935*, was to be adapted to serve as a provisional constitution. When the Indian Constituent Assembly decided to adopt a republican form of government, the new Indian constitution drew on many models, including those of Britain, Australia, Canada, Ireland, and the United States.

In Pakistan, no constitution having yet been framed, the Cabinet continued to be collectively responsible to the Constituent Assembly.

Ceylon has advanced rapidly from Crown colony status through responsible govern-



Map from 'The British Commonwealth' by courtesy of Longmans Green & Co. Limited.

The countries of the Commonwealth shown on the same scale and in their correct positions relative to lines of latitude.

Commonwealth countries lie in all latitudes and in each of the continents. Hong Kong (22° N.), Cyprus (35° N.), Malta (36° N.), Mauritius (20° S.) and other countries though important are too small to show on this scale.

ment to autonomy within the Commonwealth. Since 1945, under a new constitution, there has been provision for a two-chamber legislature with an administration responsible to Parliament. The 1945 constitution gave Ceylon full internal autonomy, except for powers reserved to the Governor to prevent discrimination against minority communities. It is understandable that this should be a matter of definition at the outset; but it may be hoped that the operation of the "conventions of the constitution" on the British model may eventually extend to all matters of minority rights. Between 1945 and the coming into force of the *Ceylon Independence Act* (4 February, 1948) the United Kingdom Government was responsible for external affairs and defence. In this interval, following the holding of elections, agreements were negotiated on these questions pending the granting of fully responsible status within the Commonwealth which has, of course, now applied for the past five years.

Though they are not now parts of the Queen's Realms, a word may be added about the position of the Republic of Ireland and of Burma. As far back as 1936 all references to the King and the Governor-General had been removed, by legislation, from the constitution of what was then called the Irish Free State; but the *Executive Authority (External Relations) Act* enabled the King to act on behalf of the Irish Free State in the appointing of diplomatic and consular representatives and in the concluding of international agreements. When the new constitution of 1937 constituted *Eire* as a "sovereign, independent, democratic State", the Executive Authority provisions were continued until 1949. On the repeal of this Act, *Eire* ceased to be a member of the Commonwealth. When *Eire* became the Republic of Ireland (18 April, 1949) it formally seceded from the Commonwealth. By subsequent United Kingdom legislation, it is laid down that the Republic of Ireland should not be regarded as a foreign country, nor should its citizens be considered to be aliens.

Until 1937 Burma had been administered as part of British India. Although a separate

constitution applied between 1937 and 1947, the intention of the United Kingdom Government was that the constitutional policy adopted for India should extend also to Burma; and Burma, in turn, was to be free to choose whether or not to remain within the Commonwealth. The Constituent Assembly elected in 1947 resolved that Burma should thereafter be an independent sovereign republic; and a treaty between the United Kingdom and Burma recognizing the independence of the latter was concluded on 17 October, 1947. The Union of Burma came formally into existence the following January.

No account of constitutional developments within the Commonwealth proper — and these developments extend also to citizenship and nationality legislation, appeals to the Judicial Committee of the Privy Council, and the use of Great Seals — should ignore the important advances towards self-government elsewhere which in less than eight years have transformed what once was called "the dependent Empire". In the West African areas a democratic federation is already in being. Consultations looking to closer association are well advanced in the British Caribbean area and in Central Africa. Important advances have been made in Malaya, and not even terroristic activities have prevented concerted attention to welfare and development. The idea of the Commonwealth, no less than the idea of a self-governing Empire, has never been a static idea; and the benefits for a widening circle of humanity must be reckoned in terms of broadening awareness of many problems shared in common.

In this Coronation Year, the Royal Style and Title takes on a peculiar interest. By definition, this is a matter of concern to all the self-governing member nations. With effect in Canada, the form of words approved by Parliament in a statutory form, and graciously proclaimed by Her Majesty, is

Elizabeth the Second, by the Grace of God of the United Kingdom, Canada and Her Other Realms and Territories Queen, Head of the Commonwealth, Defender of the Faith.

This form was agreed upon during a meeting of Prime Ministers of the Commonwealth in London in December 1952. As Mr. St. Laurent was careful to explain in the House of Commons in moving the Canadian act, there was (in Canada, Australia and New Zealand in particular) a desire to indicate that the Sovereign being recognized was in fact the Sovereign of the United Kingdom. On this ground, it was felt useful to name the one country concerned (as in the form for Canada, quoted above) and to include all other entities in the phrase "the Queen's Other Realms and Territories" rather than to name each entity individually. This is certainly in keeping with the present idea of the Commonwealth, in which the Crown (if not indeed the person of the Sovereign herself) is the visible and increasingly personal link.

It is substantially in personal terms that the Commonwealth idea may be expected to develop in the future. Her Majesty has already visited the Union of South Africa and Canada, as well as parts of East Africa, and will shortly begin a visit embracing Ceylon, Australia and New Zealand. Her late father, George VI, was the first ruling Sovereign to set foot upon the soil of Canada, and there was something fine and prophetic about the first words of greeting from the Prime Minister of Canada: "Welcome, Sire, to Your Majesty's Realm of Canada". So far from being a merely formal symbol, the Crown, and the Sovereign in person, have taken on a character probably unknown in the whole history of the British monarchy.

Change there will undoubtedly be. One example is in the definitions of nationality and citizenship which now apply in many parts of the Queen's Realms. As far back as 1914, the *British Nationality and Status of Aliens Act* attempted to secure a common status throughout the Empire as it then existed. Even if the major dominions copied the British statute, there were difficulties of recognition and definition. When a dominion wished to secure a right to a separate place on the Court of International Justice, it had to define local nationals as distinct from

British subjects (as Canada did in 1921). The present double status of Canadian citizen and British subject dates from the passing of the *Canadian Citizenship Act*, 1946. This Canadian legislation was the forerunner of comparable acts passed by the legislatures of the United Kingdom, New Zealand, Australia, Ceylon, the Union of South Africa, India and Pakistan. The Union of South Africa makes no provision for the common status of British subject or Commonwealth citizen. But there is now individual definition of what constitutes citizenship in each member nation, and how it can be acquired. For some years past, Canadian passports have contained a notation that a Canadian citizen is a British subject (referring to a section of the Citizenship Act).

For many years one of the strong legal links within the Queen's Realms was the position of the Judicial Committee of the Privy Council, which had served traditionally as the final court of appeal within the Empire and Commonwealth (though not within the United Kingdom). The right of appeal was abolished by Canada, by legislation, in 1949, and by the Union of South Africa, India and Pakistan in 1950. The result is that only from Australia, New Zealand, Ceylon and the dependencies of the United Kingdom does any appeal now lie. (The Irish Free State abolished the right of appeal in 1933).

In Canada, the surviving right of appeal was in civil cases only, as appeals in criminal cases had been discontinued from 1933 onward. In South Africa the abolition of appeals was largely a formality, since there had been ten appeals only from the beginning of the Union in 1909, and none since 1934. Appeals from India ceased from the inauguration of the Supreme Court of the Republic of India 28 January, 1950. This court has an interesting duty, as a court of original jurisdiction, in the enforcement of fundamental rights guaranteed by the constitution. The Federal Court of Pakistan became the final court of jurisdiction within that country from 1 May, 1950.

There are some who affect to see in the

diminishing of the right of appeal an important weakening of the Commonwealth tie. Others feel no doubt that the present state of Commonwealth relationships requires such a particularization. To the extent that decentralization has applied in so many directions, constitutionally as well as politically and economically, it is perhaps no bad thing that there should be a legal decentralizing as well. Certainly a large reservoir of goodwill exists in one of the most delightfully informal courts the world has known, and it is to be hoped that judges of supreme courts of the Commonwealth who have been invited to sit as members of the Judicial Committee in the past will be invited to continue to do so.

It is apparent that the Queen's Realms do

not lend themselves to easy classification as political models. There has been, through nearly two hundred years since representative government was first proclaimed in Nova Scotia, a steady development of custom and usage. There has perhaps been an increasing reliance on formal definition, but generally because function has run ahead of form, and stature in advance of status. Today responsible government has many embodiments round the world. The sway of representative institutions is increasing, and the emphasis upon welfare and development has been particularly marked over the past eight years. The Queen's Realms of the future may well be a virile expression of freedom in action and devotion to free ideas, to fit the splendour of a new Elizabethan age.





THE CINQUE PORTS OF SOUTHEAST ENGLAND

Douglas Nowers, the bell ringer of St. Peter's church, Sandwich, tolls the curfew in accordance with the custom that started soon after the Norman Conquest. His name implies that his family was one which came from the lowlands in the time of Queen Elizabeth I. Bell ringers all over the Kingdom will be busy on Coronation Day ringing joyous peals in honour of Elizabeth II.



The Cinque Ports of Southeast England

by D. W. MacROW

Photographs by Richard Stone and L. Chetwyn, courtesy U.K.I.O.

LONG before there was a Royal Navy, Kings of England gave privileges to the mariners of the five ports of Dover, Sandwich, Hythe, New Romney, and Hastings, in return for which the portsmen agreed to keep a fleet of ships on call for transporting England's armies overseas, and for the defence of her own shores. This confederacy, known as the Cinque Ports, was in force before the time of Edward the Confessor. It reached its zenith early in the fourteenth century and then declined. To the five original members, the 'Ancient Towns' of Rye and Winchelsea were added toward the end of the thirteenth century. Among the special privileges the confederacy enjoyed were freedom from tolls and customs and the restrictions of the merchant guild, and the right to salvage the cargoes of wrecked ships and to have their own court. This court was presided over by a royal officer, the Warden and Admiral of the Cinque Ports. The office

is still maintained although the ports were "has beens" when Queen Bess was a girl.

In their heyday, the portsmen were virtually independent of any control. Royal authority was too weak to prevent their smuggling and pillaging foreign shipping. Even the occasional English vessel fell victim.

The ports collapsed partly because the powerful Henry VII built the Royal Navy rather than depend on them, but mainly because of changes in the Kent-Sussex coast. The harbours have either been eroded away or silted up. Dover, the only one still a port, has an artificial harbour. Hastings is a modern watering place, and Hythe, a small seaside resort. New Romney, Winchelsea, Rye and Sandwich are now inland. Today, the Cinque Ports are symbols of one phase in Britain's past, in the area that has been Britain's invasion coast throughout her entire history.

At top:—Dymchurch Wall encloses part of the Romney Marsh, a reclaimed estuary up which William the Conqueror sailed. Martello towers built during the Napoleonic invasion scare dot the coastline. Onshore currents keep building the coast outward.



The southeast coast is the only important frontier Britain has ever had. The Romans, Saxons, Danes and Normans all attacked here. Napoleon and Hitler nearly followed suit. The white cliffs of Dover are still England's watergate.

Dover is the only member that still fulfils the original functions—defence and maritime commerce—of the Cinque (pronounced sink) Ports. Naval history has been made here as much during the last two wars as at any time in the past.





The ancient landgate of Rye, so called because every other gate of the town led down to the water. Today Rye stands on a silted creek that is almost dry when the tide is out. It is now one of the tourist centres of Sussex; its cobbled, grass-grown streets and half-timbered houses attract artists. The town was walled against the French and its gates built in the time of Edward III.

The Town Crier of Rye still makes announcements in the medieval streets. This shows Bell Street, where guards once kept a look out for invading enemy and for fires in the town, both common menaces in the Middle Ages.



The Rt. Hon. Winston Churchill is the latest of a long line of distinguished men to become Lord Admiral and Warden of the Cinque Ports. The Admiral has no ships and the Warden's forts are no longer effective, but the job is significant as a means of honouring men who have served their country in some prominent way.



The 1,300 skulls and other bones attract visitors to the crypt of St. Leonard's church in Hythe. By popular legend, these are the remains of Britons slain by invading Saxons or Danes. In reality, they were placed in the crypt to make room for later interments in the overcrowded churchyard.



Test drilling of the foundation at the proposed Coteau Creek site of the main dam on the South Saskatchewan River. This picture of the test drilling through the winter ice was taken in 1945.
P.F.R.A.

The South Saskatchewan River Project

by WILFRID EGGLESTON

THE report of the Royal Commission on the South Saskatchewan River Project was signed in October, 1952 and tabled in the House of Commons at Ottawa in January, 1953. The project as proposed consists of extensive irrigation and power works on the river, the main dam being about 80 miles upstream from the city of Saskatoon. It will require, if undertaken, the largest rolled earth dam ever constructed in Canada, 205 feet high, with a crest length of more than 8,000 feet. It would impound about 8,000,000 acre-feet of water, or more than the total average annual flow of the stream at Saskatoon, and create an artificial lake or reservoir with a 500 mile shoreline, which would extend 140 miles upstream.

The Commissioners were Dr. T. H. Hogg, chairman, G. A. Gaherty and Dr. John A. Widtsoe. The secretary was B. T. Richardson. In the following article an attempt has been made to look at this gigantic project in its geographical and historical setting, and to summarize the findings of the Royal Commission.

The headwaters of the South Saskatchewan River have their source in the icefields of the Rocky Mountains; and are copiously fed by the melting snow and rainfall on the eastern slopes of the Rockies and of the Foothill country. Eight major tributaries, the Waterton, the Belly, the St. Mary, the Oldman, the Highwood, the Elbow, the Bow and the Red Deer, converge, in due course,

into a single great river near the Alberta-Saskatchewan boundary. The total drainage area, or watershed, of the South Saskatchewan, up to the point where it joins its sister stream, the North Saskatchewan, is about 65,500 square miles. The mountain and foothill sections of the river system fall from elevations of more than 4,000 feet above sea level to about 1,700 feet above sea level at the site of the proposed dam.

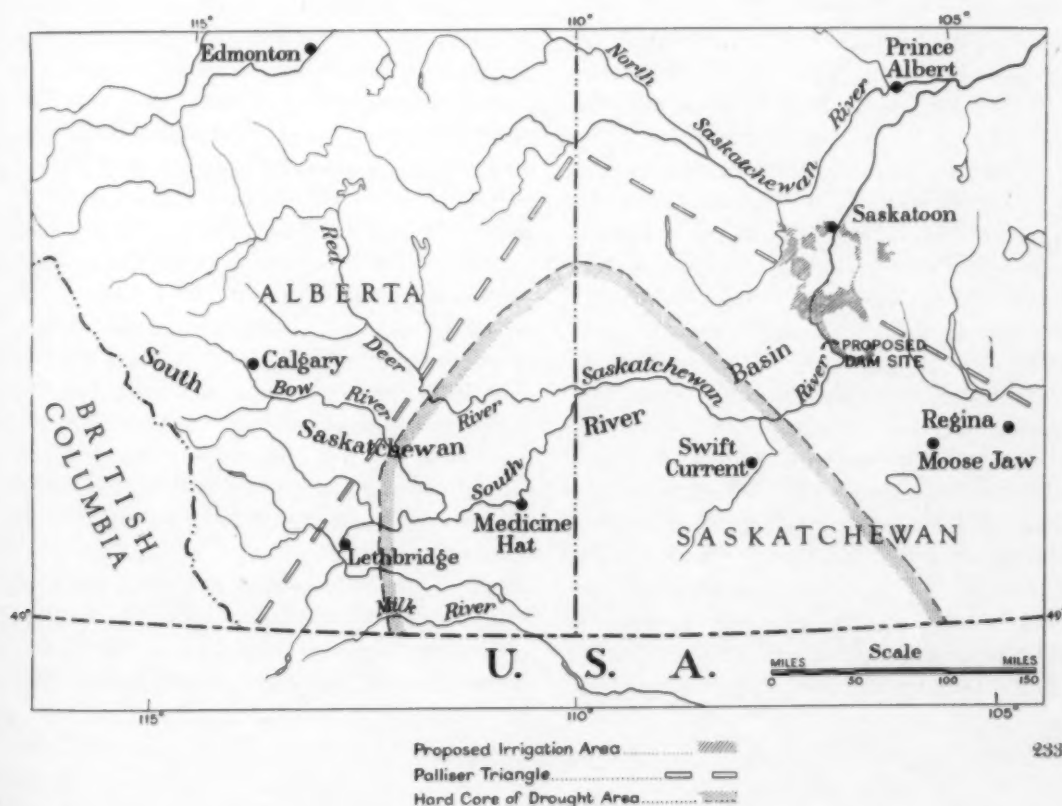
The flow of water in the South Saskatchewan River system varies tremendously with the season of the year and with the swing of the longer cycles of wetter and drier seasons. The annual spring floods reflect the effects of quickly melted accumulations of winter snowfall and the concentration of rainfall in April, May and June, a characteristic of prairie precipitation. The quantity of water flowing along the river averages up to a very substantial annual volume; from a record high of 14,610,259 acre-feet in 1915-16 to a record low of 3,440,000 acre-feet in 1940-41. (An acre-foot, as the term makes plain, is sufficient water to cover an acre of land one foot deep. Thus it is 43,560 cubic feet of water, or about 270,000

gallons.) The average annual flow of the South Saskatchewan River at Saskatoon for the period 1911-1948 was 7,128,000 acre-feet.

The highest flood on the river, in June, 1923, registered a peak flow of 131,000 cubic feet per second at Saskatoon; the lowest flow on record was under 1,000 cubic feet per second. This great fluctuation in flow emphasizes, of course, the vital importance of large-scale storage for both irrigation and power development.

Core of the Dry Region

After leaving the sub-humid slopes of the foothills of Alberta, the streams which converge to form the South Saskatchewan flow for the most part through treeless plains of relatively low annual precipitation. Indeed, the South Saskatchewan River cuts through the heart of Palliser's semi-arid Triangle. This semi-arid core averages as little as 11 or 12 inches of annual precipitation, and it is also subject to excessive evaporation because of the relatively cloudless skies and the frequent visitation of hot winds. Around this core, to the west, north and east, is a wide belt of somewhat heavier



rainfall and lower evaporation. In this latter belt the effective precipitation is usually great enough to ensure the success of dry-farming methods in growing cereals. However, within the hard core of the semi-arid region, except for the infrequent unusually wet years, cereal farming without the aid of irrigation is doomed to failure; and most of it remains at best short-grass ranching country, requiring 30 to 40 acres of pasturage to carry each head of cattle or horses.

The soil of most of the dry core of Palliser's "short grass" Triangle is light brown and is not so rich or fertile as a general rule as the darker brown soils of the "mixed prairie" belt surrounding it. However, the chief limiting factor for farming success even in the least productive part of the Triangle is lack of moisture, not soil fertility. The long frost-free period and the ample sunshine give the dry core, indeed, some advantages over other parts of Alberta and Saskatchewan when ample moisture can be provided in the form of irrigation.

By no means all lands within the dry core are available, it must be stressed, for successful irrigation. This demands suitable soil texture, appropriate topography for ditching and flooding, and an elevation which does not exceed what can be "commanded" by the ditches flowing from the diversion point in the source river. (Or at best what can be commanded by pumping a few feet.) Even when the physical conditions are favourable, irrigation farming may be condemned by excessive capital cost, excessive annual water rent, lack of skilled irrigators, or lack of markets for specialty crops, which offer the highest cash-per-acre return on such lands.

There is, in any event, much more suitable land for irrigation within the confines of the drier areas of western Canada than there is water to irrigate it. The short-grass plains which make up the driest part of western Canada occupy perhaps twenty million acres of land, of which certainly more than one-seventh possesses the necessary qualities of soil, topography, elevation and accessibility. On the assumption, first that $1\frac{1}{2}$ acre-feet

per growing season is necessary for successful irrigation, and second that about half the water originally diverted from the river is lost by evaporation and seepage on its way to the land to be irrigated, it follows that even the utilization of the complete flow of 7,127,000 acre-feet of the South Saskatchewan will not serve more than 2,400,000 acres of land. It is true that, at a cost, diversions in volume can be made from the Athabasca River to the North Saskatchewan and from the North Saskatchewan to the South Saskatchewan. Allowing for this, but also, on the other side of the account, for the fact that it would be impossible to divert every drop of water of the South Saskatchewan for irrigation in Alberta and Saskatchewan, it can be asserted with some confidence that the top limit of practical irrigation in western Canada from that river is under three million acres. As against this, the area of cultivated land in the three prairie provinces (much of which, of course, does not need irrigating) is upwards of sixty million acres, and the occupied area is about double that.

Other Uses for the Water

Before an intelligent analysis can be made of the report of the Royal Commission on the South Saskatchewan River project, at least two other sets of facts need to be examined. One is the use already being made of the waters of the South Saskatchewan River, and the other is the interest of the several affected parties in the further exploitation of the river system.

Water falling in volume from elevations above 4,000 feet to less than 2,000 feet can of course be used for the creation of hydro-electric power as well as for irrigation if suitable sites are available. What is diverted for irrigation and spread over farm areas cannot be used for power farther down the stream. Nor can water used for power be diverted at that site for irrigation. The water of the South Saskatchewan river is also of some consequence as a utility for the urban communities within the river basin. There are tourist and game conservation



Wide, flat-bottomed, high-banked water courses are characteristic of the rivers and coulees of the third prairie steppe. The difficulty of raising water to the benchlands above can be visualized.

Richard Harrington

aspects too, which must be taken into account. Three provincial governments and hundreds of municipalities are interested in the fate of the river. Unless storage facilities and forest coverage are provided in Alberta, the value of the river to Saskatchewan is reduced. If too much water is diverted in either Alberta or Saskatchewan, not enough may reach the territory within the boundaries of Manitoba for power projects of the future. These are only the most obvious inter-relationships and dependencies.

Very substantial irrigation works have been developed already, largely by use of waters of the tributaries of the South Saskatchewan River. The Royal Commission Report lists 610,000 acres as already under irrigation, most of the area being in Alberta. Another million acres of irrigation land are planned by the extension of these projects, again the lion's share being within the boundaries of Alberta.

Power development from the tributaries

of the South Saskatchewan River, all in Alberta, adds up to about 210,000 horsepower capacity to date, according to the table in the Royal Commission Report.

Early irrigation projects in Alberta took advantage of the relatively steep slopes of the foothill streams to divert water in canals which, even without storage dams, could command considerable acreages of irrigable land to the east. Even there, however, as on the St. Mary River, very material advantages could eventually be gained by the creation of a large storage basin. When the streams making up the South Saskatchewan system proceed east and north across the prairies they cut down into deep trenches and into river valleys with lofty banks which make it necessary to raise the water to considerable heights before it can command any large acreage of farm land. The construction of great dams, such as that proposed near Outlook, would raise the surface of the river as much as 180 feet; but

even so, in order to irrigate a high proportion of the nearby irrigable lands it may be necessary to pump some of this water many feet more. For example, the Coteau Creek dam project near Outlook ('The South Saskatchewan dam,' in common parlance) would irrigate about 180,000 acres by gravity, but to serve another 275,000 acres it would be necessary to lift the water, by various heights, as much as 120 feet at the top limit.

Green Oases of Irrigation

Palliser's Triangle has been subjected to devastating cycles of drought on a number of occasions, the most disastrous being in the 1930s, when a combination of low rainfall, hot winds, dust storms, soil drifting, and ruinous farm prices brought destitution to a very wide area of the three prairie provinces. During that period the contrast between the green oases of irrigation at Cardston, Brooks, Coaldale and other Alberta centres, and the dry core of the great plains region was especially striking. The knowledge that enough water was flowing through the thirsty land to Hudson Bay every year to irrigate another two million acres or more of semi-arid soil inspired in many minds a lofty vision of the future. Great new irrigation works would divert this precious fluid upon the rain-starved soil, would create a vast new Green Belt through the heart of Palliser's Triangle, make it possible to grow hay, sugar beets, fruits, vegetables, trees; to convert lonely unpainted isolated shacks into well wooded farmsteads. The presence and power of this dream must be taken into full account by any student of the present South Saskatchewan River project.

The writer of this article can, I think, claim to have some personal appreciation of the great transformation that is possible when irrigation water is applied to the dry lands of Western Canada, and some enthusiasm about its possibilities. My parents homesteaded in the heart of Palliser's Triangle in 1910, and, after fifteen heart-breaking years, abandoned their holdings

because of drought, and moved up to an irrigated farm near Lethbridge. As a college student, I helped them rebuild and re-establish, lay out irrigation ditches and irrigate wheatfields, gardens and the beginnings of a shelter belt of trees. It is little short of a miracle, to anyone raised on the semi-arid high plains, to watch the streams of life flowing on an irrigated farm in a dry summer, when the unirrigated lands are being burnt to a brown waste by the intense sun and hot winds; to contrast the lush green fields and bounteous gardens with the virtual desert near by.

It would be naive, however, to suppose that irrigation is the easy quick answer to every farm problem. Irrigation introduces many new factors, and some of these are adverse. Irrigating involves hard unremitting physical labour, it brings in its train the heavy chores of the mixed farm, it demands higher capital and rental costs, it introduces new weed problems, new soil chemistry problems, new labour problems, new marketing problems. Above all, considered on a provincial or even a community scale, it involves the problem of the fair distribution of the burden of the capital expenditure required to create and maintain the necessary irrigation works, the dams, storage basins, canals, bridges, spillways and ditches.

Financing Irrigation Projects

The financial history of the chief irrigation projects of Alberta is examined in some detail in the Royal Commission report. The earliest projects were naturally those which required a minimum of engineering, the smallest dams, the shortest canals, the lowest capital costs. It is rare to find a project, even under these circumstances, which has, over the year, paid interest on the whole capital investment. More often much if not all of the capital cost has subsequently been written off. Experience suggests that if land costs and water rentals exceed a modest per acre figure, the irrigation farmer cannot carry them. The St. Mary River project is to irrigate an additional 345,000 acres for a capital investment of about \$40,000,000.

THE SOUTH SASKATCHEWAN RIVER PROJECT

This is over \$100 per acre and if the whole cost were to be levied on the area to be irrigated it would doom it to financial disaster. The cost of the Saskatchewan River dam, which is to irrigate 455,000 acres, will be several times as much. The commission estimates that the cost of the new irrigated farm units in Saskatchewan, chargeable to irrigation, would be \$70,000 per farm unit. The old idea that all the cost of irrigation projects should be carried by the land irrigated is clearly absurd under these conditions. Some new philosophy of social and even national benefits is needed to justify the cost of such projects.

The Two Questions

The Royal Commission on the South Saskatchewan River project was asked two specific questions:

1. Whether the economic and social returns to the Canadian people on such an investment would be commensurate with the cost.

2. Whether the project represents the most profitable and desirable use of the physical resources involved.

In the remainder of this article, I shall try to describe the project in brief, summarize the answers of the commission to these two specific questions, and discuss shortly the current situation created by the Commission's Report.

It will be recalled that the long-term average flow of the South Saskatchewan at Saskatoon is 7,128,000 acre-feet annually. Commitments for upstream projects, mainly irrigation in Alberta, must be deducted from this flow to calculate what is still available at the site near Outlook for irrigation and power. The commission estimates this uncommitted flow to be 5,432,000 acre-feet. This appears to be ample for the irrigation of nearly half a million acres of land, leaving sufficient flow for development of a very large amount of hydro-electrical energy. Some of this electricity would be required for pumping irrigation water, and the re-

A combined power and irrigation dam on the Elbow River near Calgary.

C.P.R.



mainder could be fed into the power grids of the province. However, it should be noted that if a substantial proportion of the flow of the river were once permanently committed for power production, it would sharply curtail future irrigation potential.

Extensive surveys along the South Saskatchewan River in search of a site which would permit the construction of a vast storage reservoir for irrigation purposes have been conducted over a period of several years, by P.F.R.A. (the Prairie Farm Rehabilitation Administration). It is summarizing great masses of data to say simply that the most favourable site located to date has been found at Coteau Creek, about 15 miles upstream from Outlook and about the same distance downstream from The Elbow.

The advantages of this site include the following: the possible reservoir capacity there is the largest on the river, it is close to the irrigable area, it will permit diversion of water down the Qu'Appelle Valley for irrigation and domestic use; and suitable materials (earth and gravel) are available in quantity near by.

The project, as has been noted, requires the construction of an earth dam 205 feet high and 8,500 feet long, which will, if constructed, create an artificial lake 140 miles long.

Auxiliary works include an earth dam in the Qu'Appelle Valley to prevent the impounded waters from escaping down that valley; a three-mile long spillway channel; reinforced concrete outlet works; a powerhouse with an installed capacity of 150,000 horse power; 500 miles of main irrigation canals and laterals, and 12 pumping stations; a new high-level railway crossing of the Qu'Appelle Valley, to provide for C.N.R. and C.P.R. rail transportation in that vicinity.

Benefits of the Project

Such a dam at Coteau Creek would permit diversion of water down the Qu'Appelle Valley, for irrigation purposes and to maintain water levels in Long Lake and the six Qu'Appelle Valley lakes. It would provide



A combined stock watering and irrigation dam constructed by the P.F.R.A. at Admiral, Saskatchewan, south of Maple Creek. Approximately 2,200 acre-feet of water is impounded by the dam.

by gravity flow a water level in Buffalo Pound Lake adequate for a water supply for the cities of Regina and Moose Jaw. In addition to supplying water for a 150,000 horsepower generating station at the dam, the storage provided would facilitate the installation of large hydro-electric power plants down stream from Saskatoon. These, indeed, are not practicable until large storage facilities somewhere in the South Saskatchewan system have been provided. The building of the dam would virtually eliminate the flood hazard in the Pike Lake area near Saskatoon, and materially decrease the magnitude of floods in the Carrot River area.



The total drainage area at the dam-site is calculated at 48,800 square miles. At maximum water level the area of the reservoir would be 122,000 acres. The creation of such an artificial lake would flood a small area of good agricultural land, but most of the area affected is of little value. The reservoir would have substantial values in recreation and conservation. The reservoir itself would have a shoreline of almost 500 miles, and it would maintain levels in a number of other large lakes. The fluctuations in water level between the high flood stage and the low point reached during cycles of drought or maximum seasonal use might adversely affect the value of beaches along the reservoir. But in any event there would be increased facilities in the area for hunting, fishing, swimming, boating, picnicking and camping. It has been claimed that at least two-thirds of the population of Saskatchewan

would thus be brought within a two hour drive of a large body of water.

The theoretical value of irrigation in any district can be estimated by consideration of such factors as annual rainfall, average evaporation from a free surface, prevailing temperatures in summer, length of vegetative season, heat units, and hours of sunshine. By and large, areas such as that around Medicine Hat, which are low in rainfall, high in evaporation, in prevailing temperature and in length of growing season are the very best on the prairies. Towards Saskatoon on the northeast, and towards Lethbridge and Cardston to the west the advantages arising from irrigation are somewhat less marked. On the whole, the P.F.R.A. studies indicate that the proposed irrigated lands from the Coteau Creek dam are potentially somewhat inferior to the Medicine Hat area, but are about the same

as Lethbridge, so far as fundamental weather statistics can measure this value.

"Experience in Alberta and elsewhere," says the report, "indicates that irrigation farming is seldom successful in areas where natural rainfall is sufficient to permit fair crop production. This fact would seem to urge caution in the extension of irrigation northward into the parkland belt." However, "in the Elbow-Outlook area it appears that irrigation could be established on a sound agronomic basis. The climate and soils of the area seem favourable for production of usual irrigated crops. Thus the question of ultimate success of the development seems to shift to economic and sociological considerations."

One of the main economic considerations is, of course, the overall cost of the Coteau Creek project. The Royal Commission estimated this, at current prices, to be about \$250,000,000. This was very much higher than the P.F.R.A. figure, and the estimate is the subject of considerable difference of opinion.

Is it Warranted by the Benefits?

The basic question set the Commission by the government was: is the expenditure of such a sum warranted by the benefits?

Dr. K. A. H. Buckley of the University of Saskatchewan, who prepared the chapter of the report on Economic and Social Benefits of the project, distinguished between three different kinds of benefits:

1. The primary or direct economic benefits, such as the net land rents created, the value of the power project, and the water supply for Saskatchewan municipalities.

2. Secondary or indirect economic benefits, taking the form of a further increment "in the net national income or product in addition to the increase arising directly from the project".

3. The broad social benefits.

One serious difficulty about calculating even the first of these is that irrigated production would begin only after the main works of the project were complete (six or eight years at minimum from commencement of construction), and the full development

of the irrigated project could not be expected in less than forty or fifty years. To make even an intelligent guess at the additional value of production of the 455,000 irrigated acres it is necessary to make many arbitrary assumptions about the future, the nature of the crops which would be grown, the agricultural price-structure of the future as far ahead as the year 2000, and the likely cost of farm labour, farm supplies, farm equipment, many years in the future.

In the Royal Commission report, three different sets of estimates are worked out, each one for the initial stage of farm operations under irrigation, for a transitional stage, and for a mature stage. Estimated net irrigation returns per acre range all the way from 54 cents per acre to \$17.38 per acre. By capitalizing these net returns, the author of the study in the Commission's Report calculates that the value of the new irrigated land might range from \$132 per acre at maturity to \$497 per acre, the latter figure representing the most favourable combination of circumstances. (The present value of the dry land is taken to be about \$20 per acre.) For the entire tract, the value would range from \$60,000,000 to \$226,000,000 in the year 35 after commencement of actual irrigation. (If the project was begun at once, this might be about the year 1996.)

The capital values created by the power project are expected to be between twenty-five and thirty million dollars; and by the saving in supply of water to Regina, Moose Jaw, and other municipalities another four or five million dollars. Adding all these direct returns together, on the first set of assumptions they amount to \$91 millions; on the second \$126 millions; and on the third \$256 millions. If the third set of assumptions (using 1951 farm prices) is realistic, the direct returns from irrigation production, power and municipal water might, in 35 years time, equal the capital cost of the project today. There would still be the annual interest on the capital cost to reckon with. The accumulation by Year 35, using simple interest rates of $3\frac{1}{2}$ per cent would be \$190 millions.

The Commission's Balance Sheet

In its own summary of costs and benefits, however, the Royal Commission was not so optimistic as to use the third set of assumptions. Since this Commission balance sheet will perhaps provide the nub of the discussion which has already begun on the question of returns "commensurate with cost", it should be included here:

Original capital cost (Year I)	\$247,900,000
ADD	
Land acquisition (Years I-20)	9,100,000
	<hr/> \$257,000,000
DEDUCT	
Capital value of power (Year 35)	26,000,000
	<hr/> \$231,000,000
Municipal water service (Year 35)	4,300,000
	<hr/> \$226,700,000
Relief savings (Year 35)	10,500,000
	<hr/> \$216,200,000
ADD	
Accumulated deficit (Year 35: simple interest)	\$190,000,000
	<hr/> \$406,200,000
DEDUCT	
Land value of irrigated area (Year 35: 1921-48 prices)	96,000,000
	<hr/>
BALANCE — deficit at Year 35	\$310,200,000

To make the record complete it may be added that if the most favourable assumption of Professor Buckley's study on the value of the irrigated land had been adopted, the deficit quoted above would be reduced to \$180,200,000 at Year 35.

Justification for a deficit of this order in direct economic returns must be sought in the second and third categories of benefits, namely, the indirect economic benefits and the social gains from the project. These are obviously extensive, but difficult to calculate.

Gains of the Green Belt

The creation of a Green Belt, or irrigation oasis within an area of limited rainfall always affects considerable areas of adjacent dry land. Not all of the effects are beneficial, since the irrigation farmer may come to enjoy a superior competitive position over the dry-land farmer in the sale of certain commodities to available common markets. But it is assumed that on balance the development of such an irrigated area does materially help the nearby dry regions, by purchase of pasture, labour and equipment services, by the hiring of seasonal labour for irrigation, for sugar-beet culture, for help in canning and processing factories, by providing a market for dry-land cattle for finishing, by providing a sure source of feed and seed in drought cycles, and by bringing nearer to the dry-land farmer the superior service facilities of the more densely occupied irrigation districts.

There would also be some gain to the national economy through an increase in the absorptive capacity for immigration, and a more effective use of agricultural labour within the prairie region.

It is claimed, too, that such an irrigation project, by establishing the equivalent of a small new land 'frontier' would stimulate the employment of labour and capital elsewhere. Gross expenditures within the region would be multiplied by a factor of three or four or five, and these expenditures would be diffused over a large variety of enterprises throughout the country. As a stabilizing force within the prairie economy, it would tend to reduce the transmission of economic distress in drought cycles to the rest of the Canadian economy. It would tend to arrest the declining population of Saskatchewan. There would be some indirect benefits to municipal, provincial and federal governments, including an increase in the tax potential of the region.

The social gains from the project are even more difficult to measure, but the survey made by Dr. Buckley cites such things as the basis which would be provided by the Saskatchewan River Dam for an area of

closer community life. Trees, gardens, utilities and community services are mentioned. "The enhancement of individual and group amenities would be enjoyed by the inhabitants of the market centres in the region as well as by the members of the farm families involved." There would be, as already indicated, an important incidental dividend in the recreational benefits for a large part of the population of the province.

One important consideration which the Commission had to take into account in weighing the direct and indirect benefits against the financial cost was the timing of the project. If it is undertaken at a time of full national employment of labour and resources the decision to divert these to the project will result in the reduction of a similar aggregate of labour and resources in some other form of investment. The best time for such a large project would, says the Commission, in a period of slackening employment.

Constitutional Considerations

Another important consideration is legal and constitutional. The Commission lays down the principle that such developmental programs should be planned in accordance with the beneficial use of such a river in the interests of the Prairie Provinces and of Canada. "They should take account of prior allocations of water so that existing uses of the water may be protected. Between provinces there should be equitable apportionment of the flow of the river. If a river system is to be developed on the principle of its beneficial use to the people of Canada, an equitable apportionment does not mean an 'equal division' of the waters, but an apportionment having due regard to the best use from a national standpoint of the resources of the drainage basin."

Findings of the Commission

Having weighed the many factors for and against the project, the Commission answers the government's first question, whether "the economic and social returns to the Canadian people on the investment . . .

would be commensurate with the cost" in the following language:

"The Commission finds that at present the economic returns . . . are not commensurate with the cost . . . though the Project would yield social returns which, while they cannot be measured for the purpose of this Report, would be of great value to the region in which it is situated."

The Commission reports in respect to the second question that "the available data, which are by no means complete, indicate that the said Project does not represent the most profitable and desirable use which can be made of the physical resources involved."

The Commission recommends "that without delay a comprehensive, long-range program be developed that would result, over the years, in the most beneficial use being made in the interests of the people of Canada of the waters of the Saskatchewan River from its headwaters to the sea."

Alternatives

If on the basis of incomplete data the project did not seem to represent the most profitable and desirable use of the physical resources involved, the Commission was confronted with another question, not directly posed by the national government: are there alternative projects which appear more likely to meet such a test? And the Commission does proceed, in its report, to point out some possible alternatives. In addition it suggests certain immediate steps which it thinks ought to be undertaken in any event, pending further consideration of the South Saskatchewan dam at Coteau Creek.

These latter include the development of the resources of the Qu'Appelle River Valley by pumping water from the South Saskatchewan River (a dam is one means of raising water to higher levels, and a pump is another; under some circumstances it may be cheaper to pump than to build a dam). Such a supply, pumped from the river, might supply Regina and Moose Jaw and permit of considerable additional use for irrigation and recreation purposes and certain lands in central Saskatchewan might be



An aerial view of the proposed South Saskatchewan River dam site at Coteau Creek, looking upstream (south) toward "The Elbow". The mammoth earth fill would occupy a point at about the centre of the picture.

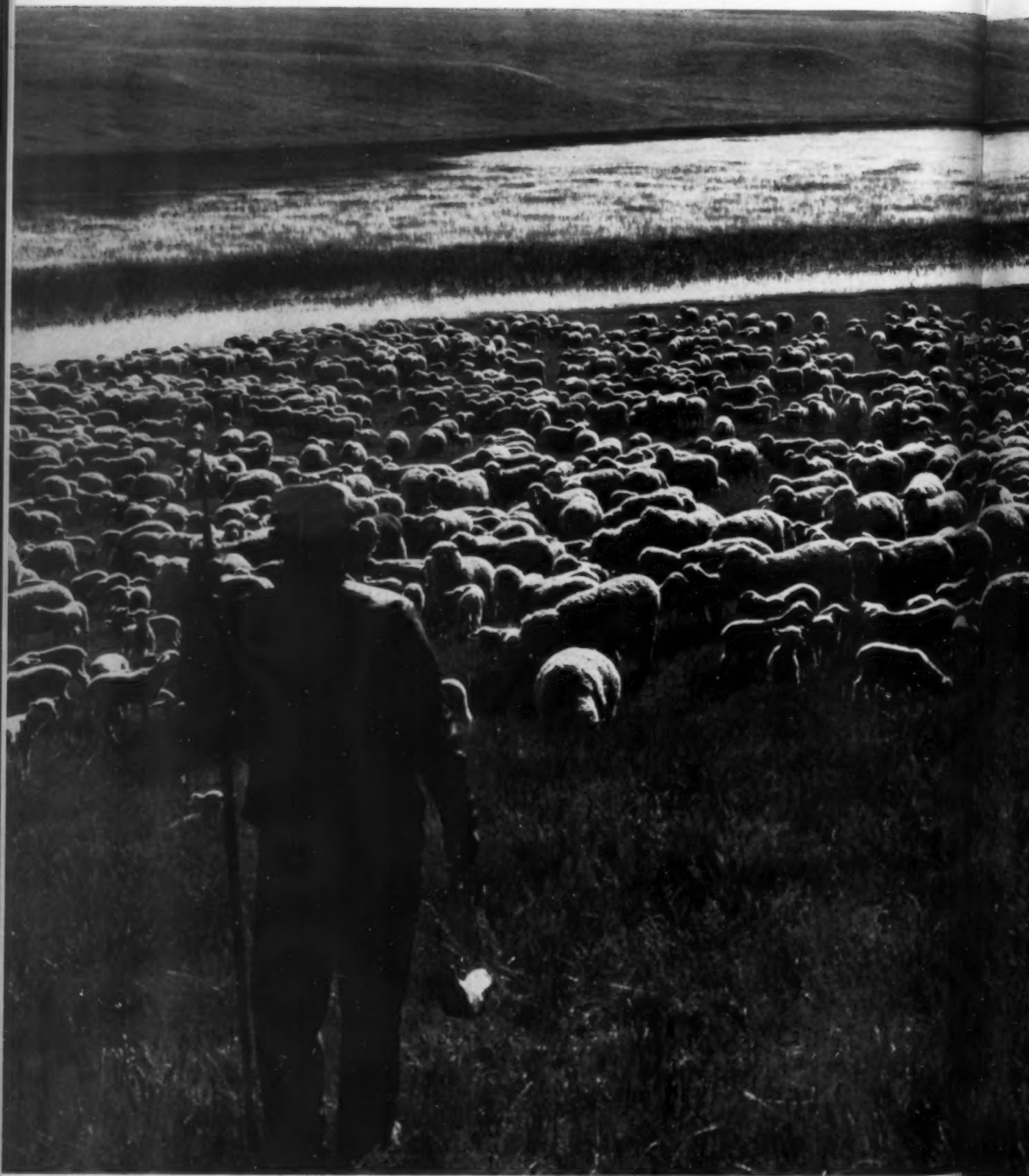
P.F.R.A

irrigated from the river in the same way without going to the cost of a dam.

The most important of the earlier schemes for large-scale irrigation from the Saskatchewan River was the Red Deer Diversion project usually connected with the name of William Pearce. The Pearce Scheme, outlined in 1921, proposed a diversion of North Saskatchewan waters into the Clearwater River, a diversion of the latter into the Red Deer, a dam and storage basin on the Red Deer, and the carrying of water through a series of lakes, canals, and siphons as far east as Saskatoon. The project, according to Ben Russell, director of Water Resources and member of the Prairie Provinces Water Board, was expected to serve 1,411,000 acres, partly in Alberta, partly in Saskatchewan at a cost of \$105,600,000. The project was at

that time abandoned as being too costly.

Whether the Red Deer Diversion is in any sense a satisfactory alternative for the Saskatchewan River dam, whether it merits future development even if the latter is proceeded with, or which combination or alternative is the more economical and more satisfactory, are matters which have already reached a sharply controversial stage; and they require far more examination and discussion for a fair presentation than can possibly be attempted in this article. The one assertion which may be made with some conviction by any student of the subject is that the invaluable water resources of the Saskatchewan River, for both irrigation and power, will some day be fully harnessed, by one scheme or another, for the benefit of the prairies and of all Canada.



At noon, the sheep "lie on water", for their midday rest. After the herder's lunch, all move slowly in some new direction for fresh forage. These are grade Rambouillets, the standard breed for range use.



The Woolly West

by LYN HARRINGTON

Photographs by

RICHARD HARRINGTON

ALBERTA is firmly associated with cattle-ranching, wheat-farming and oil-wells. Yet, surprisingly, this western province is second only to Ontario in the number of sheep raised. Some are found in farm flocks, as in Eastern Canada, but the majority are out on range in care of a "shepherd". (Not a "shepherd" in the West, where terms vary from traditional phrases.)

Just west of the Cypress Hills in southeastern Alberta, lie wide, gently-rolling plains, cut with gullies, the land of juniper, cactus and sagebrush. Not a tree breaks the skyline. Yet there is a stark beauty in those clean lines merging into the blue haze far off. A desolate region even in summer's mirages, it can be desperately lonesome and terrifying in winter's blizzards.

Sheep can find food and nourishment where horses and cattle could not survive because of a more selective palate. The sheep crop the "prairie wool"—that excellent hard forage composed of spear-grass, bunch-grass and buffalo-grass. They also love the sage after the frost has touched it. Still, a wide range is necessary, and the average is twelve acres per sheep for summer pasture.

Death lurks there in the grasses in the form of poisonous plants, notably the death camas. Sheep usually avoid these. But if the forage is too dry or too sparse, they may fall back on the green lily-like leaves, which are deadly poison at all stages.

Problems in western sheep-ranching have been the usual ones of transportation, varying markets, predatory coyotes and winter blizzards. Sheep, like cattle, drift before a storm, or crowd close together so that eventually they smother under a blanket of snow.



Veteran sheep-rancher of southeastern Alberta tenderly holds a young lamb in his arms. The number painted on the fleece is useful later for breeding.

Above right: — When the ewes drop their lambs, both are transferred from the open range to lambing pens, in the "lamb-wagon".

Below: — By six in the morning the herder is ready to start the band moving. He carries the sheep-hook, and a "tin dog" — cans strung on a wire.



The sheepherder of Alberta usually spends the summer range sun wakens both herder and sheep ab

Herder and "band" (not flock) have lost their lives in blizzards year after year.

In winter, the sheep are usually kept fairly close to the ranch house, amongst buildings where they can take shelter from storms. During the summer, the bands are on summer range. The main difficulty is to find a man with patience, affection for animals and some knowledge of sheep, and one who does not mind solitude. For the sheep are his only company on the windy flats. The herder lives in a movable sheep-camp, just large enough for the bare essentials of cot, chair, folding table and tiny stove. The camp, usu-



The herder's camp must be guyed down securely, to prevent strong winds from overturning it.



Above left: — This ewe has lost her own lamb, whose skin now covers the rejected lamb of some other ewe. Since it smells like her own, this ewe will accept the orphan, and the skin may be removed in two or three days.

Below: — A "shepherd" in the original sense is this German-born herder, whose accordion whiles away many hours on the lonely job.

summon range, living in a portable sheep-camp. The rising
herd can be seen about four o'clock.

ally perched on the highest ridge for visibility, must be wired down securely, else the winds or even the sheep crowding beneath it at night, would tip it over.

The band is never still. Heads nod constantly, and the bleating never entirely stops. The early-rising sun wakes both herder and sheep. And the lambs greet the morning with that ritual gambolling beloved of artists, jumping high and sideways, racing or playing follow-the-leader, or leaping up on rocks.

By six o'clock, the herder takes in hand his "tin dog" (cans strung on a wire to get the sheep's attention) and "sheep-hook"





A wise old ewe wears the bell, and helps to keep the band together.

(crook). He and his watchful collies start the band moving slowly in the direction opposite to that taken the previous day. Western sheep are specifically bred for their flocking habits, rather than for individualism; not only is the band easier to watch, but it permits the range to be used to best advantage.

"Bucking" (breeding) season comes early in December on the plains, when the band is back on winter range. Lambs arrive about 150 days later, and this is the busiest season for the sheep-rancher. Docking and castration must be done within two weeks.

Early in June, groups of itinerant shearers move through the country with their mechanical equipment, mowing through six-inch fleeces at the rate of a hundred or more in a day. It is strenuous work, up-ending a large sheep, turning it to get the fleece off in one piece if possible. An assistant rolls the fleece into a square bundle, ties it with paper twine, and tosses it up to a platform. The eight-foot wool bag hangs suspended, and the packer drops 20 to 22 fleeces into it, packing them down with his own weight.

The denuded sheep pass through a lane of hurdles, where another assistant brands each one with an iron figure dipped in paint. This paint brand remains on the fleece as it grows out again. Also, while the fleece is short, the sheep are dipped or sprayed as protection against ticks. Then the rancher can turn his attention from sheep to hay, for their winter feeding.

The Canadian West never experienced the "nesters' wars", those hostilities between cattlemen and sheep-ranchers which marked the American plains. A grudging attitude, the occasional uncomplimentary remark, and very rarely, a cut fence, has been the extent of disapproval. Cattle and sheep can live together in that wide country without stepping on one another's hooves.



Lambling season is followed by docking and castration, then by shearing. Here the fleeces, rolled and tied, are tossed up to the packer.

As the sheep pass through a lane of hurdles, after shearing, each is branded with paint. This "D" is the owner's initial.







Seacoast Matriarch

by ADELAIDE LEITCH

WHEN Canada acquired a tenth province, she acquired also the oldest city in the Western Hemisphere. St. John's, Newfoundland, is older than historic Halifax by two centuries and a half. She was a thriving international harbour before the Pilgrim Fathers were born, and she became—illegally—an acknowledged capital when it was forbidden even to settle on the Big Island.

For an old lady with one foot in the Atlantic, she is remarkably virile—the possessor of one of Canada's most decided personalities. Behind The Narrows and the great bulwark of Signal Hill, she is a fisherman's town, but on her main street the rubber boots and Cape Anns mingle with the stylish dress of "landlubber" families.

The old city slips right down to the rocky waterfront that encloses one of the finest natural harbours in existence. So closely does she live with her waterfront that, when a daily paper ran an April Fool picture of a steamer ploughing through the main shopping section, many of the readers gasped in real horror until they read the cutlines. In bygone days, when Water Street was "Lower Path", fishermen were a bit miffed when this six-foot-wide thoroughfare started expanding and, as a land tenure report of 1883 pointed out, "attained its breadth by encroaching on the harbour".

Today, St. John's needs that extra space. Here you can buy sealskins or skillets, beautiful drapes woven by women in lonely outport kitchens, or new parts for a schooner bound for "The Labrador". Ringing the outskirts of the city like a brood of new chicks are new, modern housing developments and, sprawled away to the northeast, is the long "white city" of Pepperrell Air Force Base, headquarters for the United



States Northeast Command. But under the city, in 200-year-old casks, are port wines being aged for the royal tables of England.

The South Side Hills, backed against the Atlantic, cradle St. John's harbour like a great, rocky hand. Chain Rock still guards the entrance, a silent reminder of the days when the townspeople stretched chains across the entrance as protection from enemy attack. The chains were used again during the last war, when a blacked-out St. John's was jammed with the ships of war.

At the start of the fishing season, when the schooners are excitedly loading for the Banks or the cod grounds of Labrador, the waterfront is a tangle of rocking masts. Passenger steamers bound for England and Boston call here, as do foreign freighters, and it is the home port for the sealing fleet that goes each year to the ice floes. But right in the centre of the harbour is a ship that never goes anywhere, and few people, looking at the blackened hulk that is a giant storage bin for salt, remember it was once the graceful, three-masted British cruiser *Calypso*.

Unheeded too is the unprepossessing metal plaque near the waterfront that marks one of the most historic spots of Canada. Its legend reads: "Close to this commanding and historic spot, Sir Humphrey Gilbert landed on the fifth day of August, 1583,

and, in taking possession of this New Found Land in the name of his Sovereign Elizabeth, thereby founded Britain's first overseas empire."

St. John's was inhabited, actually, as early as 1498, although no one was officially allowed to build a permanent home until 1811. The Big Island was regarded as a giant fishing ship anchored off the Grand Banks, and fishing admirals had strict orders to bring home every man of their crew.

Nevertheless, St. John's was undisputed "capital" before she was even recognized as a settlement. From here, the first traders of the New World plied their trade, shipping supplies to the fishing boats and to the small settlements that began to spring up round the Newfoundland coast. Fire raged through St. John's many times, and she was repeatedly at war with the French who had established their capital at Placentia to the northwest.

Yet, as time went on, she piled up probably more "firsts" than any other place in Canada—first overseas colony of Britain (1583); first wireless signal across the Atlantic when Marconi set up headquarters on Signal Hill (1901); first non-stop flight across the Atlantic, by Alcock and Brown (1919).

If she was the last capital to enter confederation, she has now become the first settled city of Canada.

Opposite, top to bottom: — A 'backdoor' view of St. John's, Newfoundland, behind its bulwark of coastal rock. Centre, right, is 'The Narrows' that form the entrance to the city's harbour; the gap, left, marks the entrance to the nearby fishing village of Quidi Vidi.

The Colonial Building was built of stone from Cork, Ireland, and has been standing since January 28, 1850. Newfoundland's House of Assembly through four forms of government, it now is the centre of provincial rule.

Longshoremen in St. John's pass the time between ships on Duckworth Street. Behind them, Cabot Tower and Signal Hill, left, guard the town.

Cod are dried right at the waterfront of St. John's. The entrance to the harbour, centre back, is all but concealed.





Tourists need not crane their necks to see the top of Mount Chephren from their glass-roofed bus. The rugged outlines of mountain and forest are reflected in Lower Waterfowl Lake.

Columbia Icefield Highway

by DAN McCOWAN

C.P.R. photographs

ON A HOT midsummer day few places in the Canadian Rockies, or elsewhere, have greater appeal to the sweltering public than Columbia Icefield. This enormous silent sea of snow and ice covers an area of 120 square miles and appreciably lowers air temperatures of the region throughout the summer, like a vast air-conditioning unit.

The highway leading from Lake Louise to the Columbia Icefield and beyond gives easy access to one of the most spectacular Alpine areas in the entire Canadian Rockies. Lofty mountains, colourful lakes, swift rushing rivers and tumbling waterfalls attract the eye. Many massive glaciers drape the shoulders of the neighbouring hills. Now

winding through fragrant pine woods, again crossing open moorland this highland road is eminently safe, there being no steep hills and few abrupt curves in its entire length. The road is a first-class gravel-surfaced one and is open during normal summer travel season. From Lake Louise to Jasper the distance is 148 miles and the Columbia Icefield is roughly half way. There is a telephone line along the entire route and contact with the outside world can be made at any of the park warden stations.

Leaving the Trans-Canada highway at Lake Louise railway station the Icefield road follows the course of Bow River for several miles and skirting the base of Mount Hector (11,135 ft.) presently brings one face to face



Tranquil contemplation of Peyto Lake. The incredibly blue waters of this lake are fed by the Peyto Glacier which flows from the Wapta Icefield and is the source of the Mistaya River.

with Crowfoot Glacier. This prominent glacier, sprawling across the face of a high steep mountain, formerly bore marked resemblance to the foot of a bird but in recent years melting of the ice has resulted in the loss of one toe and the name Crowfoot is today somewhat meaningless.

Reaching the upper fringe of the forest in a few miles, the highway emerges into open moorland and to the shore of Bow Lake, rightly regarded as one of the most attractive lakes in the Rockies. From the icy reservoir known as Bow Glacier much water drains into the lake during summer, in fact this large glacier lying astride the main range is source of both Bow River and Yoho River, one flowing east and the other west. To members of the native Assiniboine Indian tribe this lake was known as Coldwater. On the early Arrowsmith map of North America (1801) the Bow River is marked Askow or Bad River.

A modern mountain lodge set in a grove of sheltering spruce by the lake shore is a favourite resort of riders and hikers, artists and photographers.

A few miles beyond Bow Lake the highway surmounts Bow Pass and in so doing reaches an altitude of almost seven thousand feet above sea level. Nearby the streamlined Peyto Glacier and the incredibly blue Peyto Lake, named for a noted pioneer guide, are prominent in the landscape. From this lake nestling in the densely wooded valley the stream called Mistaya (Stoney Indian for grizzly bear) flows northward to join the North Saskatchewan River. On the north side of Mistaya valley the glittering spear of Mount Silverhorn is prominent while almost directly opposite stands Mount Chephren, an impressive pyramid towering high above Waterfowl Lakes at its base.

Between Waterfowl Lakes and the North Saskatchewan River and but a stone's



Parts of this enormous mass of blue-green ice may be traversed by snowmobile. Like all really spectacular Athabasca Glacier is readily accessible. It is the most impressive glacier of the Colu

throw from the highway there is a remarkable canyon well worth seeing. The silt-laden Mistaya River has during the centuries drilled deep circular holes in the horizontal slabs of rock, the whole forming

a natural history exhibit of unusual interest. Rounding the base of Mount Murchison the Mistaya presently mingles its milky waters with those of the swift North Saskatchewan River.



*g. Lateral really great individuals,
glaciers the Columbia Icefield.*

In this neighbourhood stands Mount Forbes (11,902 ft.) highest point of land in Banff National Park and named for a former principal of the United College of St. Andrews, Scotland. Here also is Mount

Alexandra named for Queen Alexandra and Mount Amery honouring a former member of the British Cabinet who was an enthusiastic mountaineer in both the Alps and the Rockies. Mention might also be made of two mountain memorials in the region, Mount Coleman perpetuating the memory of Professor A. P. Coleman of Toronto who explored much of this area in 1893, and Mount Wilson named for Tom Wilson of Banff, a famous guide in the Rockies and first white man on record to visit Lake Louise.

In this extensive national sanctuary wild life claims the attention of almost every visitor to the region. Mule deer are fairly numerous in this section of the park but whitetail deer are comparatively scarce. Moose are common in the marshes adjoining the North Saskatchewan River and its tributaries and these animals may often be seen amongst stubby willow growth on hill-sides bordering the highway. Mountain goats are perhaps as widely distributed here as in other parts of the reserve but mountain sheep are seldom seen along this route. Many wapiti or elk range the open woods and sunny clearings between Lake Louise and Bow Lake.

Amongst the small mammals native to the region red squirrels and ground squirrels are most in evidence during the summer. Numerous chipmunks scurry hither and thither amongst loose rubble by the wayside while marmots and pikas (conies) whistle and call from vantage points on nearby rock slides. A porcupine may occasionally be seen waddling clumsily across the road.

Scarcity of berry-bearing shrubs may in measure be responsible for lack of black bears on the Icefield Highway. An occasional member of the species may be sighted ranging the countryside in quest of a meal or tearing a half rotted log apart in search of ants. Grizzly bears are sometimes seen on the open moors above Bow Lake in autumn busily quarrying for marmots or unearthing gophers for seasonal food. On one occasion while coasting quietly down a stretch of the highway near Crowfoot Glacier I came almost

within car's length of an adult bear of this species trudging slowly along the road. Becoming conscious of the presence of the vehicle at his heels he left the scene in frantic haste and was soon deep in the friendly forest. This was my nearest approach to a grizzly bear at large.

Ascending Sunwapta Pass the most noteworthy scenic attraction in this section of the Canadian Rockies, the Columbia Icefield, is reached. Part of this immense body of ice lies in Jasper Park and part in the adjoining Banff reserve. The remainder spills over into British Columbia. Three of the great rivers of Canada have their source in this gelid reservoir, namely the Columbia, flowing into the Pacific Ocean, the Saskatchewan, entering the Atlantic by way of Lake Winnipeg and Hudson Bay and the Athabasca, flowing northward to the Arctic Ocean.

Numerous glaciers, which are in effect rivers of ice transporting winter snows to lower altitudes, have their source in Colum-

bia Icefield. Most accessible is the impressive Athabasca Glacier. The main highway linking Lake Louise with Jasper skirts the snout of this enormous blue-green mass of ice and one may almost step out of the automobile on to its marbled surface. During summer months specially equipped snowmobiles transport passengers to points of interest on the surface of the glacier. Like all glaciers in the Canadian Rockies this one has been gradually retreating and shrinking.

The visitor interested in bird life has a rich field for study along the Icefield Highway. Most common and most readily identified of the permanent inhabitants is the magpie which with handsome black and white plumage, long tail and raucous voice is not likely to be mistaken for any other bird in the western mountains. Clarke's crow or nutcracker, peculiar to a relatively small area of the Rockies, is another bird likely to be encountered. It is smoke grey in body colour, has black wings, a stout bill,

The Columbia Icefield, partly in Jasper and partly in Banff National Parks, straddles the Continental Divide.





Excursions over the Columbia Icefield reveal fantastic ice scenery of many forms.

a harsh voice, and nests very early in the year. In fact, it has paired and is nesting while yet the mountain tarns are icebound and the woods are deep in snow. It is noteworthy that these nutcrackers are common in the woods along the way to the Icefield despite the fact that there are no nuts.

Winters are long drawn out on the eastern slope of the Rockies of Canada and the season spoken of by poets as vernal seems ever laggard. But suddenly the mountain bluebirds have come home again and presently the swallows appear. Three species of swallow may be seen in the neighbourhood, the bank swallow, the tree swallow and the cliff swallow. On timberline moorland the white-tailed ptarmigan is sometimes seen. The word ptarmigan is from the Gaelic and means mountaineer, a singularly appropriate name for this hardy species of grouse, at home on the snowy heights during all seasons of the year.

Standing guard over the Columbia Icefield and thrust high above that silent frozen sea is a group of mountains, each more than 11,000 feet high, which might best be described as sublime. Nearest to the moon is the crest of Mount Columbia (12,294 ft.) from which an eagle with folded wings might almost hop across to the summits of Mount Alberta, Mount Athabasca, Mount Kitchener, Mount Stutfield and Mount Woolley and finally land on the gigantic mound called Snow Dome.

Bordering the Icefield Highway the predominant forest tree is lodgepole pine, frequently but wrongly called jack pine. In the valleys white spruce is abundant and thrives. At higher altitudes Englemann spruce is widely distributed. On rocky ridges stand numbers of Douglas firs, survivors from an earlier age when this was the most important coniferous tree in the region.



Crowfoot Glacier above Bow Lake. Retreat of the glacier has now deprived the crow's foot of a toe.

The most common broad-leaved tree in the Rockies is the aspen poplar (trembling aspen) whose foliage quivers in the lightest breeze and makes a pleasant sound like that created by the wings of little birds in flight. There is no fragrance more grateful than that wafted abroad in the cool of a June evening from a grove of balsam poplars. Sometimes called balm of Gilead this is a larger species of tree than the closely related aspen poplar and is most at home on the banks of streams and lakes bordering the highway. The bark of this tree is the beaver's principal food.

Woolly Labrador tea is perhaps most widespread and probably the most common shrub in the region, with bearberry a close second. Shrubby cinquefoil, serviceberry, silver willow and soapberry are common along the way. Juniper is common on dry sunny slopes, its flat thatch-like growth affording shelter to small mammals when hawks make sudden foray. It is doubtful if

elsewhere in Canada the wild rose, floral emblem of the Province of Alberta, is more showy in flower and in fruit. From early spring when the pasque-flower first appears till late autumn when the asters proffer last aid to the bumblebees there is everywhere a floral display of infinite variety and of great beauty. To the botanist and to the individual who finds wild flowers pleasing to the eye the Columbia Icefield Highway has much to offer.

Principal stopping places along the way are Bow Lake and Icefield Chalet, both modern first class lodges. There is a comfortable cabin camp at Saskatchewan River Crossing and for those who wish to pitch a tent or park a trailer, public camp sites are available. These are furnished with picnic shelters, stoves and firewood. Camping, except on designated sites, is prohibited within the boundaries of the National Parks. Accommodation is available in and near Jasper.



EDITOR'S NOTE-BOOK

Coronation Number

This month is noteworthy for the coronation of our young Queen, Elizabeth II. In order that our members may have a lasting record of the occasion, the August issue of *Canadian Geographical Journal* will be a special coronation number.

* * *

Our Contributors

James A. Gibson (*The Queen's Realms*) is Dean of the Faculty of Arts and Science and Professor of History at Carleton College, Ottawa. At present Dr. Gibson is in England where, amongst other activities, he is attending a special course on Commonwealth studies at Oxford. — Lyn and Richard Harrington (*The Woolly West*) write and photograph, as they travel the length and breadth of Canada. — Wilfrid Eggleston (*The South Saskatchewan River Project*) is well known throughout Canada for his books, his articles and his network broadcasts. In Ottawa he is especially known as Professor and Director of the Department of Journalism at Carleton College. In this article he analyses the lengthy report of the Royal Commission on the Central Saskatchewan development which has roused considerable controversy. — Adelaide Leitch (*Seacoast Matriarch*), free-lance writer and photographer, spent a year in Newfoundland, went on to see something of Europe, and has now returned to Ontario. — Dan McCowan (*Columbia Icefield Highway*), noted field naturalist, lives in Banff. His life-long study of wild life has resulted in articles, photographs, lecture tours and broadcasts on nature subjects.

1953 Netherlands Scholarship for Canada

The Netherlands Government is offering a scholarship to one Canadian citizen for study in The Netherlands during the academic year 1953-54.

University students and research workers who wish to apply for this scholarship must be pursuing graduate or post-graduate studies.

Those wishing to secure further training in creative arts, painters, architects, musicians, etc., must have sufficient training and

experience to enable them to enrol in an institution which offers advanced work in their arts.

Applicants are requested to furnish recommendations from at least three persons who are familiar with their work and who are experts in the fields concerned.

All correspondence and applications should be sent to The Netherlands Embassy, 168 Laurier Avenue East, Ottawa, before July 1, 1953.

* * *

AMONGST THE NEW BOOKS

The Mineral Resources of The World

by William Van Royen and Oliver Bowles in collaboration with Elmer W. Pehrson

(Prentice-Hall, Inc., 1952. 181 pp., \$8.00)

This Volume II Atlas of the World's Resources was prepared by the Department of Geography of the University of Maryland. Dr. Van Royen is the Professor and Head of that Department, Dr. Bowles is Research Professor and E. W. Pehrson is the Chief of the Economics and Statistics Division of the United States Bureau of Mines which supported much of the data.

The atlas does not deal with all the economically useful mineral substances, since the number of these is so high. The following were selected because of their great commercial importance: coal, petroleum, iron ore, manganese, nickel, chromite, tungsten, molybdenum, vanadium, bauxite, copper, lead, zinc, tin, mercury, gold, silver, platinum-group metals, uranium with radium and thorium, phosphate rock, sulfur and pyrites, salt, diamond, asbestos, fluorspar, graphite, mica. Water power is also included since it is regarded both as a competitor and as a conserver of fuels. For most of the individual subjects the treatment runs from four to six pages, each of a size approximately 15 by 12 inches; in the case of coal, petroleum and water power the average length is 15 pages. The information is summarized in each case under such headings as occurrence, production methods, nationality of control, reserves, world production, world trade, consumption, marketing, tariff and prices, selected references, etc.

Being an atlas, much of the information is presented in the form of maps, diagrams, graphs and tables, which provide a very clear picture of the highlights of the subject. Many of the maps are of full page size; they are excellently drawn with only the essential pictures included so that they can be read with a minimum of effort. The graphs and tables are also models of clearness and simplicity. The number of all these figures is 186.

Since a country's mineral resources form one of the principal bases of its economy, a knowledge of what his own and other countries possess in this regard is important to everyone. The present volume provides a ready reference for obtaining this information. F.J.A.

OOK-PIK

The Story of an Eskimo Boy

by William G. Crisp

(J. M. Dent, Toronto, \$3.00)

This is a story of an Eskimo boy, intended for children. It is written in a plain, straight-forward style with none of the unctuous condescension that so often marks books written by adults for "young readers". Mr. Crisp has lived in the far north and knows what he is talking about; he gives us an accurate and exciting account of a boy's life in an Eskimo family which, at first, is quite remote from our white culture. In later chapters, he visits a trading post and then acts as a guide and special constable for the Mounted Police.

There is a wealth of information and a great deal of intimate detail, with a most commendable absence of errors. This fair, well-balanced, and accurate picture of Eskimo life might well serve as a model for others who attempt the writing of children's books about primitive tribes.

DOUGLAS LEECHMAN

* * *

The Tundra World

by Theodora C. Stanwell-Fletcher

(McClelland & Stewart, Toronto, \$3.75)

This is quite a readable book and there is much of interest in it, but it labours under the disadvantage of having to compete with its predecessor from the pen of the same author, *Driftwood Valley*. It is difficult to escape the opinion that this work, based on notes made in the Churchill area in the 1930's and in 1949, is an attempt to profit by the success of the first book and that it is not as successful as it might have been.

In one way the book falls between two stools, for the

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numerous first-hand observations are hardly sufficiently detailed to be of much value to the professional ornithologist, but they are so numerous that they tend to become boring to the layman.

The author's personality, and a most pleasant one it is, shows very plainly through her writing. She obviously loves the north country, as does everybody who has ever known it; the unforgettable singing of the hundred dogs thrills her as it has so many others; and her appreciation of the virtues of the "men of the north" is warm and genuine. I regret that she has felt it necessary to cast this obviously personal record in the form of a novel with its fictitious characters; it is, at times, difficult to remember that the author is relating, not her own experiences, but those of an imaginary "Rosa-mund Reeve", who finds everything just too perfectly thrilling.

(Continued on page XIII)

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(Continued from page XII)

The frontispiece by George M. Sutton is excellent, but it is most disappointing to have the author tell us about all the good photographs "Rosamund" took and then refuse us the chance of seeing even one of them, for the frontispiece is the only illustration in the book. There are none of those wonderful drawings that John Stanwell-Fletcher does so well, and which did so much to make *Driftwood Valley* the success it was.

DOUGLAS LEECHMAN

* * *

Journey into Wonder

by N. J. Berrill

(Dodd, Mead & Co., Toronto, \$5.00)

Tales of high adventure from Columbus to Scott are re-seen through the eyes of a naturalist in N. J. Berrill's *Journey Into Wonder*. Some of the stories are common knowledge, others less well-known, yet each takes on the urgency and the virginal freshness of discovery in this re-telling.

Professor Berrill is an eminent marine biologist at McGill University. As an educationist he is interested in the growth of knowledge and of man's understanding, which "is itself a growth, and comes from individual men".

This is the key to the author's success, not only his own communicated delight in the natural wonders revealed in original notebooks, but also his appreciation of what these sights meant *at the time* to the voyagers who saw them. We sense an original awe and wonder, feel the mind's first struggle to comprehend and explain new mysteries, and through the succession of related journeys come to some appreciation of mankind's slow growth in understanding. We are never shown this growth as a dry abstraction, but see it always in individual men, swerving with their individual interests or blocked by personal blindnesses. But it is always the individual who adds to man's knowledge, the individual reaction that is important.

Professor Berrill has selected his voyagers well. He starts with Columbus and the superstitions attached by his mariners to the natural signs that were their only navigational aids. He touches on certain of the Elizabethans and continues to William Dampier, "perhaps the most amazing naturalist of all time" who, while sailing as a buccaneer, kept the most detailed and illuminating notes of natural observations, made for the sheer delight of it. Then a great succession, the young George Forster who sailed with Captain James Cook into the Antarctic and South Pacific, von Humboldt who trained under Forster and traced the Orinoco River to its connection with the Amazon, and Charles Darwin, inspired by von Humboldt's writing, who, during a five-year voyage around the world, found in Patagonia and the Galapagos fossils and strange living creatures which started his mind working on the revolutionary idea of evolution.

And so to later voyagers. The reviewer cannot even list all their names, much less indicate how vividly

Professor Berrill has sketched their personalities, or what a rich and varied tapestry he has woven about them. This book possesses considerable literary quality. It requires no special scientific knowledge in the reader but it demands thoughtful reading and will richly repay careful attention. In a world of centrifugal knowledge that tends to separate into the specialists' pigeonholes, it is refreshing to meet one scientist who seeks the interrelations of life and sees life itself as the focus of knowledge. "The purpose changes with each new voyage and is almost beside the point, for each time it is the journey itself that matters, not the reason for starting".

W. R. JOYCE

* * *

Over My Shoulder

by Madge Macbeth

(Ryerson, Toronto, \$3.25)

An invaluable addition to the growing list of books that concern themselves with Ottawa, this might well have been called "The Confessions of a Canadian Lotus Eater". It is of double interest, first because of its backward glances at Ottawa over the author's shoulder, and secondly by reason of the glimpses the reader gets of the author herself. The appeal of autobiographical sketches, especially those written by professional authors, has always been strong and it is in no way diminished here, for we are presented with many personal and intimate details from Mrs. Macbeth's own experience and recollection.

The text is not identical with the series running in the *Ottawa Citizen* under the same title; indeed, the author seems to have taken advantage of the somewhat greater freedom allowed when writing for publication in book form. The two rather unfortunate portraits on the dust jacket do not sustain, as the book so well does, our impressions and memories of a much-loved lady.

DOUGLAS LEECHMAN



ALUMINUM has been flying high in civil and military aircraft for a good many years. Recently Prof. Pierre Demers of the University of Montreal found a new use for this air-borne metal. He used aluminum to encase a camera which he sent aloft attached to a hydrogen-filled balloon in order to photograph cosmic rays, ten miles up in the cold and empty stratosphere.

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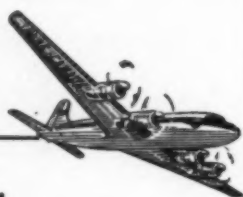
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